



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Hiroshi KAMADA et al.

Group Art Unit: 1756

Application No. 10/659,312

Examiner: M. Chapman

Filed: September 11, 2003

For: IMAGE FORMING METHOD, IMAGE FORMING APPARATUS AND TONER CARTRIDGE

DECLARATION UNDER 37 C.F.R. § 1.132

Honorable Commissioner of Patents and Trademarks

P.O. Box 1450 Alexandria, Virginia 22313-1450

Sir:

I, Yasuo KADOKURA, do declare and state as follows:

I graduated from the Graduate school of University of Tsukuba, Institute of Materials Science with a Master's Degree in Engineering in March 1995;

I joined Fuji Xerox Co., Ltd. in April 1995, and since that time, I have been engaged in the research of technologies relating developers;

I am an inventor of the subject matter disclosed and claimed in the above-identified application; and

I am familiar with the Office Action of October 17, 2005 and understand that the Examiner has rejected Claims 1 to 18 under 35 U.S.C. § 103(a) as being unpatentable over Suzuki et al. (U.S. Patent No. 6,746,810) and Yamazaki et al. (U.S. Patent No. 6,475,689),

Nishimori et al. (U.S. Patent No. 6,617,091) and/or Tomita et al. (U.S. Patent Application No. 2004/0053154).

The following additional comparative experiment was carried out under my supervision in order to make the characteristics of the cited references more clear.

Experiment 1: Preparation and Evaluation of Particles A-1 of Toner 1 of Tomita'154

The particles A-1 of the toner 1 of Tomita'154 was prepared in the same manner as described in paragraphs [0210]-[0213] of the specification of Tomita'154, and the circularity and toner circle-equivalent diameter thereof were evaluated in the same manner as described in page 54, line 12 to page 55, line 8 of the specification of the present invention so as to find that the first ratio of a number of particles having a circularity of 0.970 or greater and a diameter equal to or smaller than three-fifths of a toner circle-equivalent diameter relative to a number of particles having the diameter equal to or smaller than three-fifths of the toner circle-equivalent diameter was 7%, which exceeds 5% defined in the present invention. Additionally, it is noted that the second ratio of a number of particles having a circularity of 0.950 or less and a diameter equal to or greater than seven-fifths of a toner circle-equivalent diameter relative to a number of particles having the diameter equal to or smaller than three-fifths of the toner circle-equivalent diameter was 3%.

Experiment 2: Preparation and Evaluation of Colored Particles 6Y of  
Yamazaki '689

- Preparation of Latex -

7.08 g of an anionic surface active agent (sodium n-dodecylbenzenesulfonate: SDS, manufactured by Wako Pure Chemical Industries, Ltd.) and deionized water (2,760 g) were charged into a 5,000 ml separable flask equipped with a stirring unit having four paddles, a thermometer, and a nitrogen gas inlet unit. The content of the flask was stirred so as to dissolve the ingredients in order to obtain an aqueous solution of SDS.

The solution was further stirred at 230 rpm while inflowing nitrogen gas at 100ml/min, and an interior temperature thereof was gradually raised to 80°C at a rate of 5°C/min.

Separately, 115.1 g of styrene, 42.0 g of n-butyl acrylate, and 10.9 g of methacrylic acid were mixed and added into the solution in the 5,000 ml separable flask. Since the interior temperature was decreased by the addition process, the flask was again heated to raise the interior temperature to 80°C.

- Preparation of Releasing Agent Dispersion -

500 g of Compound (19) (pentaerythritol tetrabehenate, manufactured by Riken Vitamin Co., Ltd.), 10 g of SDS, and 2,000 g of deionized water were charged into a laboratory homogenizer (manufactured by APV Gaulin) and processed at a pressure of 35 kg/cm<sup>2</sup> at 100°C for 60 minutes. A releasing agent dispersion for the colored particles 6Y was thus prepared.

- Preparation of Colorant Dispersion -

While stirring, 9.2 g of sodium dodecylsulfate was dissolved in 160 g of deionized water. While stirring at 10,000 rpm by a homogenizer (trade name: ULTRA-TURRAX®, manufactured by IKA), 20 g of C.I. Solvent Yellow 162 (manufactured by BASF) was gradually added to the resulting solution over 3 minutes, and the resulting mixture was stirred for 60 minutes. A colorant dispersion for the colored particles 6Y was thus prepared.

- Preparation of Colored Particles -

1,230 g of the latex, 115 g of the releasing agent dispersion, 905 g of deionized water and 189 g of the colorant dispersion were charged into a 5,000 ml separable flask equipped with a stirring unit having four paddles, a thermometer, and a nitrogen gas inlet unit. The content of the flask was stirred at 200 rpm at 30°C. A pH of the thus obtained mixture was adjusted to 3.0 by adding a 1N nitric acid aqueous solution. Subsequently, an aqueous solution prepared by dissolving 52.6 g of magnesium hydroxide hexahydrate in 72 g of deionized water was added while stirring at 12.5 g/min over 10 minutes.

Thereafter, the temperature of the resulting mixture was gradually raised to 45°C at a rate of 3°C/min. Further, a process cycle of: (1) raising the temperature at a rate of 1°C/min; (2) leaving the mixture for 20 minutes; and (3) checking a particle size formed in the mixture by using a Coulter counter (trade name: TA-II, manufactured by Coulter Electronics Ltd.), was repeated plural times until the particle size became 6.3 µm. When the temperature was raised to 50°C, the particle size became 6.3 µm. Then a pH of the resultant was adjusted to 7.2 by adding a 1N NaOH aqueous solution and was stirred

at 100 rpm. Subsequently, the temperature of the thus obtained resultant was gradually raised to 90°C at a rate of 3°C/min, and the resultant was left for 6 hours while the temperature was maintained in a range of 89 to 92°C. The resultant was then cooled down to 30°C at a rate of 6°C/min.

- Evaluation -

The thus obtained colored particles provided 6.6 µm of D50(v), 0.955 of circularity, 0.030 of standard deviation, and 3.1% of coefficient of variation of circularity, which are approximately the same shape condition of the colored particles 6Y of Yamazaki '689.

It was calculated that the first ratio of a number of particles having a circularity of 0.970 or greater and a diameter equal to or smaller than three-fifths of a toner circle-equivalent diameter (namely 3.96 µm, which corresponds to three-fifths of 6.6 µm) relative to a number of particles having the diameter equal to or smaller than three-fifths of the toner circle-equivalent diameter was 12%, which exceeds 5% defined in the present invention. The second ratio of a number of particles having a circularity of 0.950 or less and a diameter equal to or greater than seven-fifths of a toner circle-equivalent diameter (namely 9.24 µm, which corresponds to seven-fifths of 6.6 µm) relative to a number of particles having the diameter equal to or smaller than three-fifths of the toner circle-equivalent diameter was 21%, which exceeds 10% defined in the present invention.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and

belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

DATE: 06 / 01 / 18

Yasuo Kadokura

Yasuo KADOKURA